



# 1993 Gordon Research Conference on Chronobiology

## Final Report

Air Force Office of Scientific Research, Grant F49620-93-1-0247

William J. Schwartz, Chair

The Gordon Research Conference on Chronobiology was held from August 9 - 13, 1993 at Colby-Sawyer College, New London, New Hampshire. There were 169 applications to attend (to my knowledge, the largest number since the Chronobiology conference began in 1978). Of the 150 which could be accommodated and accepted, a total of 143 ultimately attended (Appendix A). Conferees came from 24 states; a little over 20% of the total represented 13 foreign countries, including two from former East Bloc nations; and nearly 30% of the participants were women. Graduate students, post-doctoral fellows, junior investigators, and senior scientists were all represented.

The study of biological timekeeping is now at a particularly fertile stage, encompassing multiple levels of biological organization, recruiting a wide array of disciplines and methodologies, and uniting a host of investigators, from plant geneticists to clinical psychiatrists. This vigor was reflected in the program (Appendix B), which consisted of 24 speakers, 9 discussion leaders, and 4 senior scientists as evening "commentators."

Two sessions on the first day focused on transcriptional and translational mechanisms of circadian rhythmicity, with discussions of putative "clock genes" in cyanobacteria, algae, fungi, fruitflies, and hamsters. The discoveries of prokaryotic circadian rhythmicity, time-dependent phosphorylation of the *per* protein, and rhythmic gene products in *per* flies - to name only a few examples - clearly pose new challenges to our understanding of circadian oscillators. Two sessions on the second day addressed cellular analyses, including work on photoreceptors in frogs, neurons in molluscs, testis in moths, and immortalized suprachiasmatic nucleus cells from rats. The characterization of a clock-like defecation rhythm in *Caenorhabditis elegans* was exciting, since this model organism, with its powerful genetics and cell biology, may now prove useful in studies of biological rhythmicity. Two sessions on the third day considered clocks as physiological systems, complete with inputs for entrainment and outputs for the overt manifestation of rhythmicity. Remarkable progress included the demonstration that multiple oscillators exist within individual unicells, the role of the intergeniculate leaflet in mediating non-photic entrainment in mammals, and the likelihood that the suprachiasmatic nucleus communicates its timing signal to the rest of the brain by multiple mechanisms. The final three sessions on the last two days were devoted to specific topics. First, new methods for investigating the circadian clock in the suprachiasmatic nucleus were introduced, including infusion of antisense nucleotides, studies of immediate early gene expression, and imaging of intracellular  $Ca^{2+}$  concentrations. A session on photoperiodism ranged from cellular studies in *Gonyaulax* to maternal-fetal communication in rodents. The final session on

temperature and timekeeping included instructive presentations using chick pineal cells, social activity of voles, and hibernation in squirrels and bears. These examples demonstrated that the temperature compensation of the circadian pacemaker's free-running period need not imply a temperature insensitivity of the pacemaker's amplitude or of the entire circadian timekeeping system.

Poster sessions were also part of the formal activities of the conference. A total of 55 posters were organized by the Vice-Chair into two sessions (Appendix C), allowing participants a valuable overview as well as detailed information regarding many different research programs.

Throughout the conference, discussion was particularly animated, stimulating, and extensive. The atmosphere was conducive to the cross-fertilization and integration of disciplines, experimental approaches, and model organisms. These features contributed importantly to the success of the conference, as evaluated by the attendees (Appendix D). It is obvious from these comments that the Gordon Research Conference on Chronobiology continues to play a crucial role in the field, and the participants unanimously voted their desire to hold another conference in 1995.

By	Dist
A-1	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 1

App. (A)

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR NEIL ARONIN UNIV. OF MASS. MEDICAL SCHOOL UMMS, DEPT. OF MEDICINE 55 LAKE AVENUE NORTH WORCESTER MA	A 306 508-86-3239 ATTENDEE 01655	
A KEITH BARRETT NORTHWESTERN UNIVERSITY NSF CENTER FOR BIOLOGICAL TIMING 2153 NORTH CAMPUS DRIVE EVANSTON IL	M 8 708-491-8303 ATTENDEE 60208	
DR STEPHANY M BIELLO UNIVERSITY OF TORONTO DEPT. OF ZOOLOGY 25 HARBORD STREET TORONTO, ONTARIO CANADA	P 200 416-978-8506 ATTENDEE M5S 1A1	
DR ERIC L BITTMAN UNIVERSITY OF MASSACHUSETTS AT AMHERST DEPT. OF BIOLOGY MORRILL SCIENCE CENTER AMHERST MA	M 10 413-545-4344 ATTENDEE 01003	
DR GENE D BLOCK DEPT. OF BIOLOGY UNIV. OF VIRGINIA GILMER HALL UNIVERSITY OF VIRGINIA CHARLOTTESVILLE VA	M 12 804-982-5480 SPEAKER 22901	
DR GERARD J BOER NETHERLANDS INSTITUTE FOR BRAIN RESEARCH MEIBERGDREEF 33 AMSTERDAM THE NETHERLANDS	C 209 312056, 65509 ATTENDEE 1105 AZ	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 2

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
------------------	--------------------	-------------

DR CHRIS T BOND P 212  
OREGON HEALTH SCI. UNIV., VOLLM INST  
FOR ADV. BIOMED. RES., 3181 SOUTHWEST  
SAM JACKSON PARK ROAD MAIL CODE L-474  
PORTLAND OR 97201-3098  
ATTENDEE

DR DIANE BORRIN C 206

X ATTENDEE  
DR STUART BRODY M 7  
BIOLOGY DEPARTMENT 619-534-2619  
UCSD ATTENDEE  
LA JOLLA CA 92093

DR MAJA BUCAN P 207  
UNIVERSITY OF PENNSYLVANIA 215-898-0020  
111 A CRB, 422 CURIE BLVD.  
PHILADELPHIA PA 19104 ATTENDEE

DR GREGORY M CAHILL M 15  
UNIV. OF KANSAS MEDICAL CENTER 913-588-2716  
DEPT. OF ANATOMY & CELL BIOLOGY SPEAKER  
3901 RAINBOW BLVD.  
KANSAS CITY KS 66160-7400

DR IAIN C CAMPBELL M 9  
INST. OF PSYCHIATRY 71 7035411  
DEPT. OF NEUROSCIENCE ATTENDEE  
DECREPIGNY PARK  
LONDON SE5 8AF  
UK

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 3

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	
DR MONA E CASTEL HEBREW UNIVERSITY CELL & ANIMAL BIOLOGY LIFE SCIENCES JERUSALEM ISRAEL	91904	P 304 02-585945 ATTENDEE
DR CHRIS C CHABOT PLYMOUTH STATE COLLEGE DEPARTMENT OF NATURAL SCIENCES BOYD HALL PLYMOUTH NH	03264	M 7 603-535-2864 ATTENDEE
DR KATRIN F CHUA HARVARD MEDICAL SCHOOL PROGRAM IN NEUROSCIENCE DEPARTMENT OF NEUROBIOLOGY, EQRF-360 BOSTON MA	02115	P 209 432-0323 ATTENDEE
DR GRAHAM J COLEMAN LA TROBE UNIVERSITY DEPT. OF PSYCHOLOGY BUNDOORA, VIC AUSTRALIA	3083	M 9 6134792947 ATTENDEE
DR JAMES C COMELLI HARVARD UNIVERSITY DEPT OF CELLULAR & DEVELOP. BIO BOX 35 BIO LAB, 16 DIVINITY AVE CAMBRIDGE MA	02138	C 106 617-495-3716 ATTENDEE
DR GARY G COTE THE UNIVERSITY OF CONNECTICUT DEPT. OF MOLECULAR & CELL BIOLOGY, U-125 75 NORTH EAGLEVILLE ROAD STORRS CT	06269-3125	M 11 203-486-4351 ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 4

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR CHARLES Y CZEISLER  
BRIGHAM AND WOMEN'S HOSPITAL  
LAB FOR CIRCADIAN AND SLEEP DISORDERS  
ENDOCRINE DIVISION, 221 LONGWOOD AVENUE  
BOSTON MA 02115

M 16  
617-732-4933  
SPEAKER

DR SERGE DAAN  
UNIVERSITY GRONINGEN  
ZOOLOGICAL LABORATORY  
P.O. BOX 14  
HAREN  
NETHERLANDS

9750 AA

M 5  
31-50-632046  
DISC LDR

DR FRED C DAVIS  
NORTHWESTERN UNIVERSITY  
DEPT. OF BIOLOGY  
414 MUGAR BLDG  
BOSTON MA 02115

M 11  
617-437-4039  
DISC LDR

DR PATRICIA J DE COURSEY  
UNIVERSITY OF SOUTH CAROLINA  
DEPT OF BIOLOGICAL SCIENCES  
SUMTER AND GREENE STREETS  
COLUMBIA SC 29208

P 303  
803-777-3934  
ATTENDEE

DR HORAUO D DE LA IGLESIA  
UNIV. OF MASSACHUSETTS, AMHERST  
BIOLOGY DEPT.  
MORRILL SCIENCE BUILDING  
AMHERST MA 01002

M 5  
413-545-4344  
ATTENDEE

DR ANTONI DIEZ-NOGUERA  
UNIVERSITY OF BARCELONA  
LABORATORY DE FISIOLOGIA  
FACULTAT DE FARMACIA, AV JOAN XXIII S/N  
BARCELONA 08028  
SPAIN

OFF  
3434907869  
ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 5

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH  
CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR JEANNE F DUFFY NORTHEASTERN UNIVERSITY LAB FOR CIRCADIAN MEDICINE-BRIGHAM & WOMEN'S HOSP, 221 LONGWOOD AVENUE RM 454 BOSTON MA	P 300 617-732-7995 ATTENDEE 02115-5817	
DR JAY C DUNLAP DARTMOUTH MEDICAL SCHOOL DEPT. OF BIOCHEMISTRY 7200 VAIL, RM 413 HANOVER NH	C 207 603-650-1108 ATTENDEE 03755-3844	
DR DAVID J EARNEST UNIV OF ROCHESTER SCHOOL OF MEDICINE DEPT OF NEUROBIOLOGY & ANATOMY BOX 603 601 ELMWOOD AVE ROCHESTER NY	C 212 716-275-6117 SPEAKER 14642	
DR TAKASHI EBISAWA 275 BROADWAY, LEFT SIDE ARLINGTON MA	M 6 617-726-8 ATTENDEE 02174	
DR ISAAC EDERY BRANDEIS UNIVERSITY AND HHMI DEPT. OF BIOLOGY, 235 BASSINE BRANDEIS UNIVERSITY WALTHAM MA	M 17 617-736-3161 ATTENDEE 02254	
DR LELAND N EDMUNDS STATE UNIVERSITY OF NEW YORK/STONY BROOK DIV. OF BIOLOGICAL SCIENCES LIFE SCI. BLDG., ROOM 370 STONY BROOK NY	A 304 516-632-8537/8 ATTENDEE 11794	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 6

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH  
CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	

DR JEFFREY A ELLIOTT  
UNIVERSITY OF CALIFORNIA SAN DIEGO  
DEPARTMENT OF PSYCHIATRY 0667  
CIRCADIAN PACEMAKER LAB 9500 GILMAN DR  
LA JOLLA CA 92093-0667  
M 18  
619-534-7191  
ATTENDEE

DR MARK G ERLANDER  
THE SCRIPPS RESEARCH INSTITUTE  
DEPARTMENT OF MOLECULAR BIOLOGY, MB-10  
10666 NORTH TORREY PINES ROAD  
LA JOLLA CA 92037  
M 18  
619-554-4314  
ATTENDEE

DR ARNOLD ESKIN  
UNIVERSITY OF HOUSTON  
DEPARTMENT OF BIOCHEMISTRY  
HOUSTON TX 77204-5934  
C 210  
713-743-8381  
CHAIRMAN

DR JERRY F FELDMAN  
UNIV. OF CALIF. SANTA CRUZ  
BIOLOGY DEPARTMENT  
SANTA CRUZ CA 95064  
C 208  
408-459-2604  
DISC LDR

DR BRIGITTE FRISCH  
BRANDEIS UNIVERSITY  
DEPARTMENT OF BIOLOGY  
235 BASSINE  
WALTHAM MA 02254  
P 201  
617-736-3172  
SPEAKER

DR BEATRIZ FUENTES-PARDO  
UNIV. NACIONAL AUTONOMA DE MEXICO  
DEPARTAMENTO DE FISIOLOGIA, FAC. DE MED.  
APDO. POSTAL NO. 70-250  
MEXICO, D.F. 04510  
P 303  
525-623-2362  
ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 7

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	

DR ROBERT L GANNON M 14  
CIRCADAIN NEUROBIOLOGY RESEARCH GROUP 210-536-3814  
ARMSTRONG LABORATORY (CFTO) ATTENDEE  
2504 D DR. STE. 1  
BROOKS AFB TX 78235

DR MENNO P GERKEMA C 304  
GRONINGEN UNIVERSITY 31-50-632027  
ZOOLOGY LABORATORY SPEAKER  
P.O. BOX 14, NL 9750 AA HAREN  
HAREN NL 9750 AA  
THE NETHERLANDS

DR MICHAEL E GEUSZ M 14  
UNIVERSITY OF VIRGINIA 804-982-5481  
DEPARTMENT OF BIOLOGY ATTENDEE  
GILMER HALL  
CHARLOTTESVILLE VA 22903

DR JADWIGA M GIEBULTOWICZ P 203  
UNIVERSITY OF MARYLAND/USDA 301-504-8038  
10300 BALTIMORE BLVD BLG 306 RM 322 SPEAKER  
BARC-EAST USDA/ARS/BA INS. NEUR.HOR. LAB  
BELTSVILLE MD 20705-2350

DR MARTHA U GILLETTE P 202  
UNIVERSITY OF ILLINOIS 217-244-1355  
DEPT. OF CELL & STRUCTURAL BIOLOGY DISC LDR  
506 MORRILL HALL, 505 S. GOODWIN AVENUE  
URBANA IL 61801

DR VAN D GOOCH M 19  
UNIVERSITY OF MINNESOTA-MORRIS 612-589-6372  
DIVISION OF SCIENCE & MATH ATTENDEE  
MORRIS MN 56267

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 8

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY

AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	

DR MICHAEL R GORMAN M 19  
UNIVERSITY OF CALIFORNIA AT BERKELEY 510-642-5888  
DEPARTMENT OF PSYCHOLOGY ATTENDEE  
BERKELEY CA 94720

DR LAUREL L HAAK P 212  
STANFORD UNIVERSITY 415-723-9709  
DEPT. OF BIOLOGICAL SCIENCES ATTENDEE  
GILBERT HALL BOX 116  
STANFORD CA 94305-5020

DR GENEVEIVE M HADDAD P 301  
AIR FORCE OFFICE OF SCIENTIFIC RESEARCH 202-767-5021  
AFORSR/NL BOLLING AFB DC 20332-0001 ATTENDEE  
110 DUNCAN AVENUE SUITE B 115  
WASHINGTON DC 20332-0001

DR RUDIGER HARDELAND C 305  
I. ZOOLOGISCHES INSTITUT +551-395414  
UNIVERSITAT GOTTINGEN SPEAKER  
BERLINER STR. 28, D-3400  
GOTTINGEN  
GERMANY

DR PAUL E HARDIN C 101  
TEXAS A&M UNIVERSITY 409-845-7756  
DEPARTMENT OF BIOLOGY AND CENTER FOR ATTENDEE  
ADVANCED INVERT MOLECULAR SCIENCE  
COLLEGE STATION TX 77843-3258

DR JACOB P HARNEY C 101  
UNIV. OF KENTUCKY, COLLEGE OF MED. 410-706-6028  
DEPT. OF PHYSIOLOGY ATTENDEE  
M531 MEDICAL CENTER  
LEXINGTON KY 40536-0084

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 9

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR MICHAEL H HASTINGS  
UNIVERSITY OF CAMBRIDGE  
DEPARTMENT OF ANATOMY  
CAMBRIDGE  
UK

CB2 3DY

M 10  
SEE COMMENTS  
ATTENDEE

DR J. WOODLAND HASTINGS  
HARVARD UNIVERSITY  
16 DIVINITY AVENUE  
DEPT. OF CELLULAR & DEVELOPMENTAL BIOLOG  
CAMBRIDGE MA

02138

C 104  
617-495-3714  
DISC LDR

DR MICHAELA HAU  
MAX-PLANCK-INSTITUT  
FUR VERHALTENSPHYSIOLOGIE  
VON-DER-TANN-STR 7 ABT. PROF GWINNER  
8138 ANDECHS  
GERMANY

8138

P 306  
08152/373-17  
ATTENDEE

DR SABINE HEIGL  
MAX-PLANCK-INSTITUT  
FUR VERHALTENSPHYSIOLOGIE  
VON-DER-TANN-STR 7 ABT. PROF GWINNER  
8138 ANDECHS  
GERMANY

8138

P 306  
08152/373-37  
ATTENDEE

DR H. CRIG HELLER

C 102

C

ATTENDEE

DR MARTHA HOTZ VITATERNA  
NORTHWESTERN UNIVERSITY  
DEPT OF NEUROBIOLOGY & PHYSIOLOGY 2153 N  
CAMPUS DRIVE, NSF CTR FOR BIOL. TIMING  
EVANSTON IL

60208

P 302  
708-491-8303  
ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 10

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH  
CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
------------------	--------------------	-------------

DR MARK W HURD  
UNIVERSITY OF TORONTO  
DEPARTMENT OF PSYCHOLOGY  
100 ST GEORGE STREET  
TORONTO  
CANADA

MC 2  
416-978-3433  
ATTENDEE

M5S 1A1

DR HELENA ILLNEROVA  
ACADEMY OF SCI. OF THE CZECH REPUBLIC  
INSTITUTE OF PHYSIOLOGY  
VIDENSKA 1083  
PRAGUE 4  
CZECH REPUBLIC

P 300  
4721151  
ATTENDEE

14220

DR NORIO K ISHIDA  
NATIONAL INSTITUTE OF BIOSCIENCE  
AND HUMAN TECHNOLOGY  
1-13 TSUKUBA SCIENCE CITY305  
SCIENCE CITY305  
JAPAN

C 104  
81-298-54-6072  
ATTENDEE

305

DR MASAHIKO ISHIUYA  
NATIONAL INST FOR BASIC BIOLOGY  
DEPT OF CELL BIOLOGY  
NISHIGO-RAKA, MYODAIZI-CHO  
OKAZAKI  
AICHI  
JAPAN

C 103  
ATTENDEE

444

DR BALZER IVONNE  
I. ZOOLOGISCHES INSTITUT  
UNIVERSITY OF GOETTINGEN  
BERLIN STR 28  
GOETTINGEN  
GERMANY

P 308  
ATTENDEE

37073

DR DANIEL S JANIK  
UNIVERSITY OF TORONTO  
DEPARTMENT OF ZOOLOGY  
25 HARBORD STREET  
TORONTO  
CANADA

C 106  
416-978-8506  
SPEAKER

M5S 1A1

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 11

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH  
CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR AMY E JETTON UNIVERSITY OF MASSACHUSETTS DEPT. OF BIOLOGY MORRILL SCIENCE CENTER AMHERST MA	01003	P 302 413-545-4344 ATTENDEE
DR MEGAN E JEWETT HARVARD UNIVERSITY PIERCE HALL ROOM 318 DIVISION OF APPLIED SCIENCES CAMBRIDGE MA	02138	C 203 617-495-3789 ATTENDEE
DR CARL H JOHNSON VANDERBILT UNIVERSITY DEPARTMENT OF BIOLOGY, BOX 1812-B NASHVILLE TN	37235	C 310 615-322-2384 ATTENDEE
DR JANET E JOY NIMH (NIH) NIMH NEUROSCIENCES CENTER LABORATORY OF BIOCHEMICAL GENETICS WASHINGTON DC	20032	C 206 202-373-6037 ATTENDEE
DR SAT BIR S KHALSA UNIVERSITY OF VIRGINIA NSF CENTER FOR BIOLOGICAL TIMING DEPT. OF BIOLOGY, GILMER HALL CHARLOTTESVILLE VA	12901	C 303 804-982-5481 ATTENDEE
DR THOMAS S KILDUFF STANFORD UNIVERSITY SCHOOL OF MEDICINE SLEEP RESEARCH CENTER DEPT. OF PSYCHIATRY TD-114 STANFORD CA	94305	C 301 415-723-9380 ATTENDEE

App. (B)

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 12

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR TAKAO KONDO NATIONAL INSTITUTE FOR BASIC BIOLOGY MYODAIJI OKAZAKI JAPAN	444	C 103 81-564-55-7603 SPEAKER
DR JON M KORNHAUSER NORTHWESTERN UNIVERSITY DEPT. OF NEUROBIOLOGY AND PHYSIOLOGY 2153 SHERIDAN ROAD EVANSTON IL	60208	M 8 708-491-2872 SPEAKER
DR CONSTANTINOS KOUMENIS UNIVERSITY OF HOUSTON DEPT. OF BIOCHEM. AND BIOPHYSICS SCI. 3201 CULLEN BLVD. HOUSTON TX	77004	C 302 713-743-8388 ATTENDEE
DR DANIEL F Kripke UNIVERSITY OF CALIFORNIA, SAN DIEGO 9500 GILMAN DRIVE, 0667 LA JOLLA CA	92093-0667	C 302 619-554-7131 ATTENDEE
DR JENNIFER J LAROS DARTMOUTH MEDICAL SCHOOL DEPT. OF BIOCHEMISTRY 7200 VAIL ROOM 413 HANOVER NH	03755-3844	C 207 603-650-1154 ATTENDEE
DR THERESA M LEE UNIVERSITY OF MICHIGAN 3042 NEUROSCIENCE LAB BLDG 1103 E. HURON ST ANN ARBOR MI	48103-1687	P 210 313-936-1495 SPEAKER

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 13

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR MICHAEL T LEWIS UNIVERSITY OF CALIFORNIA, SANTA CRUZ SINSHEIMER LABS. DEPT. OF BIOLOGY SANTA CRUZ CA	A 204 408-459-4225 ATTENDEE	
DR DENNIS W LIU UNIVERSITY OF WASHINGTON DEPARTMENT OF GENETICS, SK50 SEATTLE WA	C 306 206-543-3117 SPEAKER	
DR ROBERT LYNCH UNIVERSITY OF COLORADO ENVIRONMENTAL, POPULATION & ORGANISMIC B BOULDER CO	A 110 303-492-7056 ATTENDEE	
DR ROB MC CLUNG DARTMOUTH COLLEGE DEPT. OF BIOLOGICAL SCIENCES GILMAN 6044 HANOVER NH	A 207 503-646-3940 ATTENDEE	
DR MARIJA MEDANIC UNIV. OF ILLINOIS, UIUC 524 BURHILL HALL 407. S. GOODWIN AVENUE URBANA IL	C 214 217-244-1842 ATTENDEE	
DR MICHAEL MENAKER UNIVERSITY OF VIRGINIA DEPT. OF BIOLOGY, GILMER HALL CHARLOTTESVILLE VA	A 214 804-982-5767 DISC LDR	
	22903	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 14

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR MARTHA W MERROW DARTMOUTH MEDICAL SCHOOL DEPT. BIOCHEMISTRY HB 7200 HANOVER NH	C 203 603-650-1120 ATTENDEE 03755-3844	
DR ELIZABETH L MEYER DEPT. OF PSYCHIATRY & BEHAVIORAL SCIENCE HEALTH SCIENCE CENTER, SUNY STONY BROOK NEW YORK	P 200 516-444-1614 ATTENDEE 11794	
DR STEPHAN H MICHEL UNIVERSITY OF VIRGINIA DEPT. OF BIOLOGY GILMER HALL, R285 CHARLOTTESVILLE VA	C 303 804-982-5481 ATTENDEE 22903	
DR ERIC M MINTZ UNIVERSITY OF CALIFORNIA SANTA CRUZ DEPARTMENT OF BIOLOGY SANTA CRUZ CA	A 207 408-459-2745 ATTENDEE 95064	
DR MARIA MITTAG HARVARD UNIVERSITY DEPT OF CELL & DEVEL. BIOLOGY 16 DIVINITY AVE CAMBRIDGE MA	P 205 617-495-3716 SPEAKER 02138	
DR MARGARET M MOGA UNIV OF PITTSBURGH CENTER FOR NEUROSCIENCE B5T W1601 PITTSBURGH PA	P 305 412-648-9873 ATTENDEE 15261	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 15

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR ROBERT Y MOORE UNIVERSITY OF PITTSBURGH CENTER FOR NEUROSCIENCE BST W1656 PITTSBURGH PA	A 212 412-648-8322 SPEAKER 15217	
DR LARRY MORIN SUNY HEALTH SCIENCE CENTER DEPT. PHYCHIATRY STONY BROOK NY	A 216 516-444-1613 ATTENDEE 11794	
DR MARY E MORRIS HARVARD MEDICAL SCHOOL DEPARTMENT OF NEUROBIOLOGY 220 LONGWOOD AVENUE BOSTON MA	P 209 617-432-0323 ATTENDEE 02115	
DR NICHOLOS MROSOVSKY UNIVERSITY OF TORONTO DEPT. OF ZOOLOGY TORONTO ONTARIO CANADA	A 216 416-978-8506 ATTENDEE M5S 1A1	
DR MARTA B NUNEZ-REGUEIRO UNIVERSITY OF HOUSTON DEPT. OF BIOCHEM. AND BIOPHYSICS SCI. HSC BLDG. #402 HOUSTON TX USA	C 210 713-743-8382 ATTENDEE 77204-5934	
DR PATRICK J O'CONNOR THE UNIVERSITY OF GEORGIA DEPT OF EXERCISE SCIENCE ATHENS GA	A 213 706-542-4382 ATTENDEE 30602-3654	

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 16

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR TERRY L PAGE  
VANDERBILT UNIVERSITY  
DEPARTMENT OF BIOLOGY, BOX 42B  
NASHVILLE TN

C 310  
615-322-2256  
ATTENDEE

37235

DR GARY E PICKARD  
UNIVERSITY OF PENNSYLVANIA  
DEPT. OF PSYCHIATRY  
422 CURIE BLVD.  
PHILADELPHIA PA

A 209  
215-898-0787  
ATTENDEE

19104-6141

DR COLIN S PITTEENDRIGH  
NSF CENTER FOR BIOLOGICAL TUNING  
2309 FAIRWAY DRIVE  
BOZEMAN MT

B 105  
406-587-2005  
DISC LDR

59715

DR BERNARD P POSSIDENTE  
SKIDMORE COLLEGE  
BIOLOGY DEPARTMENT  
NORTH BROADWAY  
SARATOGA SPRINGS NY

OFF  
518-584-5000  
ATTENDEE

12866

DR JEFFREY L PRICE  
ROCKEFELLER UNIVERSITY  
1230 YORK AVE.  
DR. MICHAEL YOUNG'S LAB  
NEW YORK NY

A 213  
212-327-8654  
ATTENDEE

10021

DR WOLFGANG PUCHALSKI  
WESLEYAN UNIVERSITY  
DEPARTMENT OF BIOLOGY  
MIDDLETOWN CT

A 110  
203-347-9411  
ATTENDEE

06549

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 17

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR ARCADY A PUTILOV  
INSTITUTE OF PHYSIOLOGY S.B. RAMS  
2 TIMAKOVA STR  
NOVOSIFIRSK  
NOVOSIFIRSK RUSSIA  
RUSSIA

MC 6  
73832358048  
ATTENDEE

DR MICHAEL A REA  
ARMSTRONG LABORATORY  
AL/CFTO  
BEECKS AFB TX

A 209  
210-536-2194  
ATTENDEE

DR UWE REDLIN  
WESLEYAN UNIVERSITY  
DEPT. OF BIOLOGY  
LAWN AVENUE  
MIDDLETON CT

A 309  
203-347-9411  
ATTENDEE

DR JENNY R REDMAN  
DEPT. OF PSYCHOLOGY, MONASH UNIVERSITY  
WELLINGTON RD, CLAYTON, VICTORIA 3168  
VICTORIA  
AUSTRALIA

P 308  
03-565-3957  
ATTENDEE

DR STEPHAN G REEBS  
UNIV. OF DE MONCTON  
DEPT. DE BIOLOGIE  
MONCTON  
MONCTON NB  
CANADA

A 301  
506-858-4384  
ATTENDEE

DR LUDGER RENSING  
UNIVERSITY OF BREMEN DEPT OF BIOLOGY  
PO BOX 3304-40 D-2800 BREMEN  
NW 2 LEOBENERSTR  
2800 BREMEN 33 GERMANY

A 316  
421-218-2126  
ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 18

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	

DR STEVEN M REPPERT A 112  
MASSACHUSETTS GENERAL HOSPITAL 617-726-8450  
JACKSON 1226 DISC LDR  
BOSTON MA 02114

DR MICHAEL H ROBERTS A 314  
CLARKSON UNIVERSITY 315-268-4498  
DEPARTMENT OF BIOLOGY ATTENDEE  
POTSDAM NY 13699-5806

DR TILL ROENNEBERG A 107  
INST. FOR MEDICAL PSYCHOLOGY 49-89-5996650  
UNIV. OF MUNICH SPEAKER  
GOETHESTR 31  
MUNICH 8000  
GERMANY

DR MICHAEL ROSBASH A 112  
HOWARD HUGHES MEDICAL INST. 617-736-3160  
BRANDEIS UNIVERSITY DISC LDR  
DEPT. OF BIOLOGY  
WALTHAM MA 02254

DR ALAN M ROSENWASSER A 204  
UNIVERSITY OF MAINE 207-581-1954  
DEPARTMENT OF PSYCHOLOGY, LITTLE HALL ATTENDEE  
ORONO MA 04469-5742

DR FRANCOIS ROUYER M 17  
BRANDEIS UNIVERSITY- DEPT. OF BIOLOGY 617-736-3161  
415 SOUTH ST. ATTENDEE  
WALTHAM MA 02254  
USA

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 19

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR NORMAN F RUBY  
STANFORD UNIVERSITY  
DEPT. OF BIOLOGICAL SCIENCES  
GILBERT HALL  
STANFORD CA 94305-5020

C 102  
415-725-0924  
ATTENDEE

DR PETER RUOFF  
ROGALAND UNIVERSITY CENTER  
P.O. BOX 2557  
CHEMISTRY DEPARTMENT  
STAVANGER NORWAY 4004

A 202  
47-4-87-4777  
ATTENDEE

DR KATHLEEN D RYAN  
UNIVERSITY OF PITTSBURGH, SCHOOL OF MED.  
DEPT. OBSTETRICS, GYNECOLOGY & REPROD.  
MAGEE-WOMENS HOSPITAL; FORBES AT HALKET  
PITTSBURGH PA 15213

P 204  
412-641-4053  
ATTENDEE

DR KATHRYN SCARBROUGH  
NORTHWESTERN UNIVERSITY  
DEPT. NEUROBIOLOGY & PHYSIOLOGY  
2153 SHERIDAN ROAD  
EVANSTON IL 60208-3520

C 201  
308-467-3245  
ATTENDEE

DR WILLIAM J SCHWARTZ  
UNIV. OF MASS. MEDICAL SCHOOL  
DEPT. NEUROLOGY  
55 LAKE AVE. NORTH  
WORCESTER MA 01655

MSUITE  
508-856-4147  
CHAIRMAN

DR AMITA SEHGAL  
UNIVERSITY OF PENNSYLVANIA  
233 STEMMER HALL, DEPT OF NEUROSCIENCE  
36TH AND HAMILTON WALK  
PHILADELPHIA PA 19041

C 204  
215-573-2985  
ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 20

CONFERENCE REGISTRATION LIST

93-S-CSS-9

COLBY SAWYER SOUTH

CHRONOBIOLOGY

AUG-08-93

NAME AND ADDRESS

ROOM #  
BUS TEL.

GUEST NAMES

DR DONALD SHAW  
THE UNIVERSITY OF CONNECTICUT  
DEPT. OF PHYSIOLOGY/NEUROBIOLOGY U-154  
3107 HORSEBARN HILL RD. BLDG. 4. RM. 19  
STORRS CT

SEE COMMENTS  
ATTENDEE

06269-4154

DR KAZUHIRO SHIMIMURA  
GILMER HALL  
DEPT. OF BIOLOGY  
CHARLOTTESVILLE VA

A 206  
804-982-5768  
ATTENDEE

22901

DR DORIT SHWEIKI  
HEBREW UNIVERSITY  
MOLECULAR BIOLOGY DEPARTMENT  
HADASSAH MEDICAL SCHOOL  
JERUSALEM  
ISRAEL

C 204  
972-2428496  
ATTENDEE

91010

DR RAE SILVER  
BARNARD COLLEGE-COLUMBIA UNIVERSITY  
3009 BROADWAY  
PSYCHOLOGY DEPT.  
NEW YORK NY

P 206  
212-854-3930  
ATTENDEE

10027

DR KATHLEEN K SIWICKI  
SWARTHMORE COLLEGE  
BIOLOGY DEPT.  
500 COLLEGE AVE.  
SWARTHMORE PA

P 207  
215-898-0021  
ATTENDEE

19081

DR JOAN G SPEH  
UNIVERSITY OF PITTSBURGH  
CENTER FOR NEUROSCIENCE, W1656 PSYCH.  
BIOMEDICAL SCIENCE TOWER  
PITTSBURGH PA

C 202  
412-648-8322  
ATTENDEE

15261

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR JOSEPH S TAKAHASHI NORTHWESTERN UNIVERSITY NEUROBIOLOGY & PHYSIOLOGY 2153 NORTH CAMPUS DRIVE EVANSTON IL	60208	A 303 708-491-4598 ATTENDEE
DR JUNICHI TAKEUCHI UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL, DEPT OF NEUROLOGY 55 LAKE AVENUE NORTH WORCESTER MA	01655	A 206 508-856-4147 ATTENDEE
DR BARBARA A TATE MIRIAM HOSPITAL & BROWN UNIVERSITY DEPT. OF PSYCHIATRY 164 SUMMIT AVENUE PROVIDENCE RI	02906	BE 201 401-331-8500 ATTENDEE
DR WALTER R TAYLOR HARVARD UNIVERSITY BIOLOGICAL LABS 16 DIVINITY AVENUE CAMBRIDGE MA	02138	A 203 617-495-3716 ATTENDEE
DR FRED W TUREK NORTHWESTERN UNIVERSITY 2153 N. CAMPUS DRIVE DEPARTMENT OF NEUROBIOLOGY EVANSTON IL	60208	A 105 708-491-2865 DISC LDR
DR RUSSELL N VAN GELDER DEPARTMENT OF BIOCHEMISTRY, STANFORD DEPT. OF BIOCHEM. BECKMAN CENTER B400 STANFORD UNIVERSITY SCHOOL OF MEDICINE STANFORD CA	94305	M 2 415-723-7596 SPEAKER

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 22

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM #	GUEST NAMES
	BUS TEL.	

DR OLIVIER A VAN REETH  
CERB. UNIVERSITY OF BRUSSELS  
HOP. ERASLE  
808 ROUTE DE LENNIK  
BRUSSELS  
BELGIUM

1070

A 211  
32-2-556427  
ATTENDEE

DR ANTHONY N VANDENPOL  
STANFORD UNIV. DEPT. BIOLOGY  
YALE UNIV. SECT. NEUROSURGERY  
333 CEDAR ST  
NEW HAVEN CT 06510

A 208  
203-785-5823  
ATTENDEE

DR NARAYANAN VISWANATHAN  
NORTHEASTERN UNIVERSITY  
414 MUGAR BLDG.  
DEPT. OF BIOLOGY  
BOSTON MA 02115

A 210  
617-437-2557  
ATTENDEE

DR GARY T WASSMER  
VANDERBILY UNIVERSITY  
BOX 1812, STATION B, DEPT. OF BIOLOGY  
390 24TH. AVE. S.  
NASHVILLE TN 37235

A 205  
607-322-2256  
ATTENDEE

DR EDWARD T WEBER  
UNIVERSITY OF ILLINOIS  
DEPARTMENT OF PHYSIOLOGY  
524 BURRILL HALL, 406 SOUTH GOODWIN AVE  
URBANA IL 61801

C 214  
217-244-1842  
ATTENDEE

DR THOMAS WEHR  
NATIONAL INST. OF MENTAL HEALTH  
NIMH 10, 4S-239  
9000 ROCKVILLE PIKE  
BETHESDA MD 20892

A 312  
301-496-2141  
ATTENDEE

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR CHARLES J WEITZ HARVARD MEDICAL SCHOOL DEPT. OF NEUROBIOLOGY, EQRF-360 220 LONGWOOD AVENUE BOSTON MA	02115	A 310 617-432-0322 ATTENDEE
DR DAVID K WELSH HARVARD MEDICAL SCHOOL PROGRAM IN NEUROSCIENCE 220 LONGWOOD AVENUE BOSTON MA	02115	A 202 617-735-7349 ATTENDEE
DR MALCOLM B WILKINS GLASGOW UNIV BOTANYD EPT GLASGOW UK		B 216 ATTENDEE G12 8QQ
DR PHYLLIS M WISE UNIVERSITY OF KENTUCKY SCHOOL OF MEDICINE DEPARTMENT OF PHYSIOLOGY LEXINGTON KY	40536	C 201 606-233-5254 SPEAKER
DR JOHN C WOOLUM CALIFORNIA STATE UNIVERSITY PHYSICS DEPT. CSULA 5151 STATE UNIVERSITY DR. LOS ANGELES CA	90032	A 307 213-343-2116 ATTENDEE
DR MICHAEL W YOUNG ROCKEFELLER UNIVERSITY HOWARD HUGHES MEDICAL INSTITUTE 1230 YOUR AVENUE NEW YORK NY	10021	A 305 212-327-8645 ATTENDEE

10-AUG-93  
E171

GORDON RESEARCH CONFERENCES

PAGE 24

CONFERENCE REGISTRATION LIST

93-S-CSS-9  
COLBY SAWYER SOUTH

CHRONOBIOLOGY  
AUG-08-93

NAME AND ADDRESS	ROOM # BUS TEL.	GUEST NAMES
DR MARTIN ZATZ N.I.M.H. 36/2A-17, LCB, NIMH. BETHESDA MD	20892	A 108 301-496-5590 SPEAKER
DR YAN ZHANG NORTHWESTERN UNIVERSITY NBP HOGAN HALL 2153 SHERIDAN RD. EVANSTON IL	60208-3520	A 301 708-491-5687 ATTENDEE
DR WILLIAM F ZIMMERMAN AMHERST COLLEGE BIOLOGY DEPARTMENT AMHERST COLLEGE AMHERST MA	01002	A 302 413-542-2073 ATTENDEE
DR PIOTR ZLOMANCZUK WESLEYAN UNIVERSITY DEPARTMENT OF BIOLOGY WESLEYAN UNIVERSIT LAWN AVE MIDDLETOWN CT	06459-0170	A 309 203-347-9411 ATTENDEE
DR IRVING ZUCKER UNIVERSITY OF CALIFORNIA PSYCHOLOGY DEPT BERKELEY CA	94720	510-642-7136 DISC LDR

## **GORDON RESEARCH CONFERENCES**

### **Gordon Research Conference on Chronobiology**

**August 9 - 13, 1993**

**Colby-Sawyer College (S), New London, N.H.**

**William J. Schwartz, Chair**

**Serge Daan, Vice-Chair**

#### **Monday Morning - 9:00 a.m. to 12:15 p.m.**

**Michael Rosbash (Brandeis Univ.), Discussion Leader**  
**Transcriptional and Translational Mechanisms I**

**Takao Kondo (National Institute for Basic Biology, Myodaiji, Japan)**

**Prokaryotic circadian rhythms of gene expression reported by bacterial luciferase**

**Maria Mittag (Harvard Univ.)**

**Circadian control of gene expression in the bioluminescence system of the marine dinoflagellate *Gonyaulax polyedra***

**Jon Kornhauser (Northwestern Univ.)**

**Light-activated signal transduction pathways in the suprachiasmatic nucleus**

#### **Monday Evening - 7:30 p.m. to 10:00 p.m.**

**Michael Young (Rockefeller Univ.), Discussion Leader**  
**Transcriptional and Translational Mechanisms II**

**Jay Dunlap (Dartmouth Medical School)**

***Neurospora* - the molecular identity of a clock gear and hand**

**Brigitte Frisch (Brandeis Univ.)**

**Elements of the *period* gene's cyclical expression in the *Drosophila* brain**

**Russell van Gelder (Stanford Univ.)**

**Circadian control of gene transcription in *Drosophila melanogaster***

**Monday Commentary : Jerry Feldman (Univ. Calif., Santa Cruz)**

Tuesday Morning - 9:00 a.m. to 12:15 p.m.

Arnold Eskin (Univ. Houston), Discussion Leader  
Clocks in Culture

Gregory Cahill (Univ. Kansas Medical Center)  
A circadian oscillator in vertebrate retinal photoreceptors

Gene Block (Univ. Virginia)  
Cellular analysis of circadian rhythms in isolated neurons

David Earnest (Univ. Rochester Medical Center)  
Establishment, characterization, and subcloning of immortalized cell lines derived from the rat suprachiasmatic nucleus

Tuesday Evening - 7:30 p.m. to 10:00 p.m.

J. Woodland Hastings (Harvard Univ.), Discussion Leader  
Unfamiliar Clocks

Jaga Giebultowicz (U.S. Dept. Agriculture)  
Circadian pacemaker in insect testis controls release and maturation of sperm

Dennis Liu (Univ. Washington)  
Mutations affecting periodic behavior in *C. elegans*

Tuesday Commentary : Michael Menaker (Univ. Virginia)

Wednesday Morning - 9:00 a.m. to 12:15 p.m.

Serge Daan (Groningen Univ. Netherlands), Discussion Leader  
Clocks *In Situ* - Input Mechanisms

Till Roenneberg (Univ. Munich)  
Living with two clocks

Daniel Janik (Univ. Toronto)  
Mechanisms of non-photic phase shifting

Charles Czeisler (Brigham and Women's Hospital)  
Mechanisms of entrainment of the human circadian pacemaker

Wednesday Evening - 7:30 p.m. to 10:00 p.m.

Fred Turek (Northwestern Univ.), Discussion Leader  
Clocks *In Situ* - Output Mechanisms

Rae Silver (Barnard College)  
What do suprachiasmatic nucleus grafts really do?

G. Robert Lynch (Univ. Colorado)  
The suprachiasmatic nucleus *in vitro*, melatonin, and seasonal behavior  
in the Djungarian hamster

Wednesday Commentary : Colin S. Pittendrigh (Stanford Univ.)

Thursday Morning - 9:00 a.m. to 12:15 p.m.

Martha Gillette (Univ. Illinois), Discussion Leader  
Suprachiasmatic Nucleus - New Tools

Phyllis Wise (Univ. Kentucky College of Medicine)  
Use of antisense nucleotides to study the circadian clock

Michael Hastings (Univ. Cambridge, U.K.)  
Functional domains of the suprachiasmatic nucleus

Anthony van den Pol (Yale Univ. School of Medicine)  
Digital imaging of cellular behavior in the suprachiasmatic nucleus

Thursday Evening - 7:30 p.m. to 10:00 p.m.

Steven Reppert (Massachusetts Gen. Hosp.), Discussion Leader  
Photoperiodic Mechanisms

Rüdiger Hardeland (Univ. Göttingen, Germany)  
Photoperiodism at the cellular level: rhythms and effects of  
indoleamines in *Gonyaulax polyedra*

Theresa Lee (Univ. Michigan)  
Communication of photorefractoriness from mother to pups

Thursday Commentary : Robert Y. Moore (Univ. Pittsburgh)

Friday Morning - 9:00 a.m. to 12:00 p.m.

Irving Zucker (Univ. Calif., Berkeley), Discussion Leader  
Temperature and Timekeeping

H. Craig Heller (Stanford Univ.)  
Circadian rhythmicity in hibernating ground squirrels

Menno Gerkema (Univ. Groningen, Netherlands)  
Synchronization of ultradian activity rhythms in common voles: the role  
of environmental temperature

Martin Zatz (Natl. Inst. Mental Health)  
Thermal effects on melatonin rhythms in chick pineal cells

App. D

CHRONOBIOLOGY - COLBY SAWYER COLLEGE (S)  
CONFeree COMMENTS

SCIENCE:

1. Excellent scientifically and socially.
2. The conference was excellent, timely, and covered new developments.
3. A good conference with most papers at the cutting edge. As a plant biologist, I must say that it was a pity that there was only one talk on higher plants but this does reflect the fact that there are rather few people studying higher plant rhythm all this time.
4. Chronobiology conference excludes clinical research. Some lectures were too long or poor.
5. More papers on human rhythms and medical implications needed.
6. There seems to be a split between those involved in molecular techniques and those involved from a more biological/behavioral point of view. Maybe that will change with time.
7. It seems that several of the talks represented projects that are possibly promising and interesting, but have been presented in a far from convincing and complete format for the past (at least) 1.5 years. It seems that some quality control may be possible, or some way to communicate displeasure with presenters for their own quality control.

DISCUSSION:

8. Discussion/session leaders need to insure that all hear the questions and comments from the audience by a brief recap or restatement.

MANAGEMENT:

9. Poster sessions could be held in the evening after 6:30 p.m. and the evening talks in the afternoon.
10. Great conference. Good balance of topics (light on human). Easy to talk to people. Speakers were excellent. Poster were excellent. Dividing the posters into 4 sessions and leaving them up for two days was helpful. Hold the next chronobiology conference in Newport, R.I. on the beach!
11. I've been to all of the Gordon Conferences on chronobiology (one of 2 people) and thought that this had the best organization of all of them!
12. Some speakers were not well selected. Please speak at a moderate speed. Some speakers spoke too fast and non-natives could not catch up. Questions should be made using a microphone. We need several microphones among audiences.
13. Interdisciplinary mix was good. In a future meeting, I would like to see a sleep/rhythm mix. It would be good to try some poster discussion sessions allowing presenters 1 or 2 slides.
14. Mix it up. Why one whole day of molecular then nothing the rest of the conference?

CHRONOBIOLOGY - COLBY SAWYER COLLEGE (S)  
CONFeree COMMENTS

15. The meeting was unusually current and interactive. The chair promoted a relaxed pace combined with presentations of new, highly visible research findings. The combination was invigorating! Great job.
16. Goals, themes, objectives? I've never heard anyone actually state these. I'm not sure I'd want to. Poster sessions would be improved if even posters were one day, and odd posters the next instead of 1-13 and 14-26. This would take advantage of the entire room and reduce crowding.
17. As usual, a wonderful conference. This year's organizers were outstanding in putting together a high quality meeting.
18. There should have been more presentations per day or a shorter conference.
19. Lets go to Italy!
20. The morning session would be better if there were 2 speakers, then coffee, and then the final speaker, for attention span reasons. Overall, I like the structure of 3 morning speakers and 2 evening speakers and then a summary.
21. An excellent meeting! Probably the best "rhythms" meeting I've attended. The chair has put together an outstanding program, highlighting excellent work from many different labs, including many relative newcomers to the field. The speakers have been uniformly impressive, presenting new approaches and exciting new results.
22. Small group/subtopic meeting might be schedule on one evening.
23. I would have liked to receive abstracts of the posters.

ATMOSPHERE:

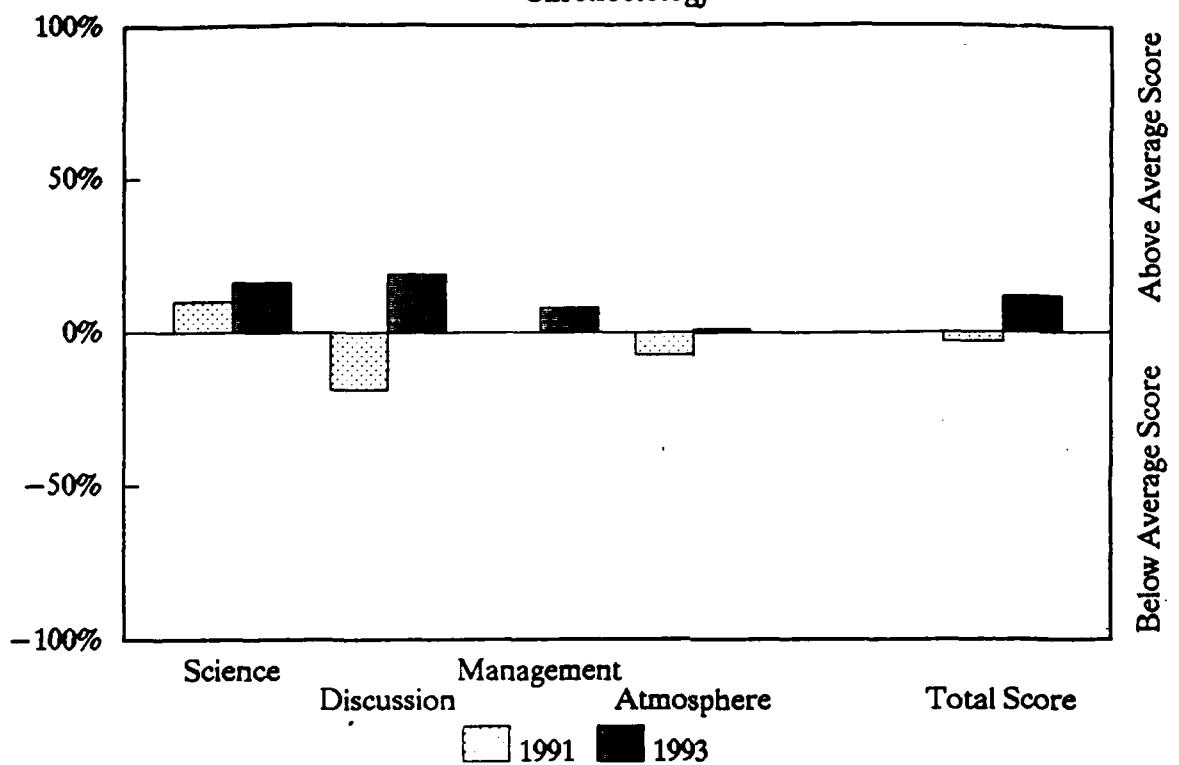
24. Great conference.
25. Excellent - The best chronobiology conference to date and all have been good.
26. Excellent.
27. Fantastic conference - the best of the several excellent chronobiology Gordon Conferences I have attended over the last 8 years, and more stimulating than G.C.s I have attended on other subjects.
28. This continues to be stimulating and very important to the field in spite of proliferation of related meetings (e.g. neuroscience, soc. study of biological rhythms).
29. This conference continues to attract the best scientists in the field and in increasing numbers. The meeting has played an important role in the development of the field, especially the interactions between U.S. and European workers.
30. The best Gordon Conference overall that I have attended (I've done 4).
31. Excellent conference! Very informative.

CHRONOBIOLOGY - COLBY SAWYER COLLEGE (S)  
CONFeree COMMENTS

32. In general, I am very happy to be here and I wish to attend this type of G.R.C. again and again.
33. The best conference that I have ever been to.

# 1993 Overall Conference Comparison

## Chronobiology



### CONFERENCE SCORES: Chronobiology

Conference Scores:	1993	1991	Average Conference Scores
Science:	25.45	24.13	21.93
Discussion:	20.27	13.85	17.08
Management:	15.74	14.56	14.56
Atmosphere:	15.83	14.48	15.61
-----	-----	-----	-----
Total Score:	77.29	67.02	69.19

Gordon Research Conferences

## **GORDON CONFERENCE CHRONOBIOLOGY 1993**

### **POSTER EXHIBITS**

#### **EXHIBIT A:**

**Posters up: Monday morning**

**Posters down: Wednesday morning**

**Monday 16:30-18:00:**

**Poster session A1, authors of posters A1-A13 present at their posters.**

**Tuesday 16:30-18:00:**

**Poster session A2, authors of posters A14-A26 present at their posters.**

#### **EXHIBIT B:**

**Posters up: Wednesday morning**

**Posters down: Friday morning**

**Wednesday 16:30-18:00:**

**Poster session B1, authors of posters B1-B13 present at their posters.**

**Thursday 16:30-18:00:**

**Poster session B2, authors of posters B14-B26 present at their posters.**

GORDON CONFERENCE CHRONOBIOLOGY 1993

POSTERS

EXHIBIT A. (August 9-10)

A-1 Michael T. Lewis, Jerry F. Feldman (University of California, Santa Cruz):  
Comparative phylogenetic analysis of the *frq* (frequency) clock locus from several fungi reveals conserved and non-conserved regions.

A-2 David K. Welsh, Diomedes E. Logothetis, Steven M. Reppert (Laboratory of Developmental Chronobiology, Massachusetts General Hospital; Dept. of Cardiology, Children's Hospital, Program in Neuroscience, Harvard Medical School, Boston):  
Synaptic and nonsynaptic communication among cells cultured from rat suprachiasmatic nucleus.

A-3 James Comolli, Walter Taylor, J.W. Hastings (Biological Laboratories, Harvard University, Cambridge, MA):  
Inhibitor of protein phosphorylation lengthens tau and blocks light phase shifts in *Gonyaulax polyedra*.

A-4 Marija Medanic, Martha U. Gillette (Department of Cell and Structural Biology, University of Illinois, Urbana, IL):  
The mammalian circadian pacemaker shows bimodal sensitivity to regulation by neuropeptide-Y.

A-5 S. Michel, K. Manivannan, J.J. Zaritzky, G.D. Block (Department of Biology, University of Virginia, Charlottesville, VA):  
Whole cell currents in cultured circadian pacemaker neurons of Bulla.

A-6 M. M. Moga, R. Y. Moore (Depts. of Psychiatry, Neurology, Behavioral Science and the Center for Neuroscience, University of Pittsburgh):  
The paraventricular thalamic nucleus as a component of the circadian timing system in the rat.

A-7 Bernard Possidente (Skidmore College, Saratoga Springs, NY):  
Olfactory bulb role in a mouse circadian system.

A-8 Wolfgang Puchalski, G. Robert Lynch (Dept. Biology, Wesleyan University, Middletown, Ct.):  
Photoperiodic time measurement in Djungarian hamsters evaluated from T-cycle studies.

A-9 Arcady A. Putilov (Biological Rhythms Research Lab. Institute of Physiology, Siberian Branch, Russ. Acad. of Med. Sciences, Novosibirsk, Russia):  
A somnosestat model can predict time course of slow wave activity during multiple sleep latency test.

A-10 Martin Ralph, Diego Golombek, Gerry Honrado, Mark W. Hurd (Department of Psychology, University of Toronto):  
Transgenic mice and circadian clocks: Fos-less and and NGF Receptor-less, but not Timeless.

A-11 O. van Reeth, Y. Zhang, M. Lesourd, F. W. Turek (Dept. Neurobiology & Physiology, Northwestern University, Evanston; Centre des Rhythmes Biologiques, University of Brussels; Servier Company, Paris): Chronic treatment with sulbutiamine can reverse some age-related changes in hamster's circadian rhythms.

A-12 Alan Rosenwasser (Department of Psychology, University of Maine): Do presynaptic alpha-2 noradrenergic autoreceptors mediate circadian phase-shifting by clonidine ?

A-13 Alan Rosenwasser (Department of Psychology, University of Maine): Photic and non-photic phase-shifting associated with routine cage-maintenance.

A-14 Martha W. Merrow, Jay C. Dunlap (Department of Biochemistry, Dartmouth Medical School, Hanover, NH): Functional and molecular characterization of a homolog of *N. crassa* *frq*.

A-15 François Rouyer (Dept. of Biology, Brandeis University, Waltham, MA) Cloning of a circadianly regulated gene expressed in the head of *Drosophila melanogaster*.

A-16 Norman F. Ruby, H.C. Heller (Dept. of Biological Sciences, Stanford University, Stanford, CA): Low temperature shortens the period of circadian neuronal rhythms in the suprachiasmatic nucleus (SCN) of golden-mantled ground squirrels *in vitro*.

A-17 Peter Ruoff (Rogaland University Center, Stavanger, Norway): Temperature compensation in any reaction kinetic model of circadian oscillations.

A-18 Kazuhiro Shimomura, Michael Menaker (Dept. of Biology, University of Virginia, Charlottesville VA 22901) Effects of the *tau* Mutation on Circadian Phase Shifting by Light.

A-19 Kathleen K. Siwicki, M.G. Folwell, W. Bug, P. Jacobs, K. Shinkai, Z. Verney, M. Bucan (Biology Department, Swarthmore College, Swarthmore, PA 19091) Cellular rhythms in the PER antigen in *Drosophila* and *Manduca*.

A-20 Junichi Takeuchi, William Shannon, Neil Anonin, William J. Schwartz (Department of Neurology, University of Massachusetts): Compositional changes of AP-1 DNA-binding proteins are regulated by light in a mammalian circadian clock.

A-21 Barbara Tate (Dept. of Psychiatry, Miriam Hospital, Providence, RI): Circadian abnormalities induced by the Alzheimer beta-amyloid protein.

A-22 N. Viswanathan, Fred C. Davis (Dept. of Biology, Northeastern University, Boston, Ma.): Activation of dopaminergic system mediates maternal entrainment in hamsters.

A-23 G. T. Wassmer, T. L. Page (Dept. of Biology, Vanderbilt University, Nashville, Tn.):  
Photoperiodic regulation of a putative storage protein in the cockroach *Parcoblatta pennsylvanica*.

A-24 E.T. Weber, M.U. Gillette (Department of Physiology, University of Illinois, Urbana, Ill.):  
Identification of protein kinase G as an SCN substrate for phosphorylation during the circadian cycle.

A-25 C. R. McClung, Z. R. Liu, E. A. Pease, M. L. Pilgrim, H. H. Zhong ():  
Circadian and light regulated gene expression in *Arabidopsis*.

A-26 Daniel F. Kripke (University of California, San Diego, La Jolla):  
Human light exposure and its correlates.

#### EXHIBIT B (August 11-12)

B-1 P. Badhakchani, N. W. S. Chong, C. Coen, K. Marsden, J. F. Powell, I. C. Campbell (Institute of Psychiatry and King's College, London, U.K.):  
Circadian studies of rat SCN: temporal differences in mRNA expression.

B-2 N. W. S. Chong, P. Badhakchani, C. Coen, K. Marsden, J. F. Powell, D. Sugden, I. C. Campbell (Institute of Psychiatry and King's College, London, U.K.):  
Differential expression of an mRNA in chick pineal over 24 hours.

B-3 Ivonne Balzer (Zoological Institute, University of Göttingen, Germany):  
Circadian rhythmicity of encystment and excystment in *Gonyaulax polyedra*.

B-4 Stephany M. Biello, N. Mrosovsky (Depts. of Zoology and Physiology, Univ. of Toronto, Ont. Canada M5S 1A1)  
Antiserum to neuropeptide-Y attenuates phase shifts in response to induced wheel running.

B-5 Pamela J. Carter, Malcolm B. Wilkins, Hugh G. Niclmo, Charles A. Fewson (Dept. of Botany and Biochemistry, Glasgow University, Glasgow G12 8QQ, U.K.):  
Temperature regulation of phospho-enol-pyruvate carboxylase activity in relation to the circadian rhythm of CO<sub>2</sub> exchange in *Bryophyllum* leaves and the temperature compensation of the period.

B-6 Patricia J. DeCoursey, C. Sandlin, S. Pius, C. Herrin (University of South Carolina, Dept. of Biological Sciences, Columbia SC):  
Relationship of Circadian Temperature Cycles and Activity Rhythms in Rodents.

B-7 A. Diez-Noguera, A. Campuzano, J. Vilaplana, T. Cambras (Laboratori de Fisiologia, Facultat de Farmacia, Universitat de Barcelona):  
Effects of period length of light/dark cycles in the circadian rhythms of motor activity and in the growth rate of young Wistar rats.

B-8 **Takashi Ebisawa, Yukiko Sasaki, Takeo Deguchi** (Lab. of Developmental Chronobiology, Massachusetts Gen Hospital, Boston, USA): Complementary DNA's for Two Arylamine N-Acetyltransferases with Identical 5'-Noncoding Region from Rat Pineal Gland.

B-9 **Isaac Edery** (Dept. of Biology, Brandeis University, Waltham, MA) Temporal Phosphorylation of the Drosophila Period Protein.

B-10 **Jeffrey A. Elliott, Colin S. Pittendrigh** (Dept. Psychiatry, U.C. San Diego): Phase relationship of evening and morning oscillators regulates amplitude of hamster PRC to light.

B-11 **Beatrix Fuentes-Pardo, M. Lara-Aparicio, S. López de Medrano** (Departamento de Fisiología, Facultad de Medicina, Instituto de Matemáticas Universidad nacional Autónoma de México, México 04510, MEXICO) Mathematical simulation of the action of external stimuli on the circadian rhythm of electroretinogram of crayfish.

B-12 **Menno P. Gerkema, Eddy A. van der Zee, Louis E. Feitsma** (Zoology Laboratory and Department of Animal Physiology, Groningen University): The number of arginine-vasopressin immunoreactive cells in the SCN correlates with the degree of expression of circadian rhythmicity in common voles, *Microtus arvalis*.

B-13 **M.E. Geusz, S. Michel, G.D. Block** (Department of Biology, University of Virginia, Charlottesville, VA): Intracellular calcium responses of circadian pacemaker neurons measured with fura-2.

B-14 **R. Keith Barrett, Joseph S. Jakahashi** ((NSF Center for Biological Timing, Dept. of Neurobiology and Physiology, Northwestern University, Evanston IL 60208) Temperature compensation of the chick pineal circadian clock.

B-15 **Mona Castel** (Department of Cell and Animal Biology, Hebrew University of Jerusalem): Organotypic culture of the suprachiasmatic nucleus, particularly the GABA-ergic innervation.

B-16 **Van D. Gooch, J. C. Thoen** (Division of Science & Math, Univ. Minnesota, Morris Mn): Time lapse video of circadian conidiation in *Neurospora*.

B-17 **P. Hardin** (Department of Biology, Texas A & M University, College Station, Texas): Circadian cycling of period mRNA is correlated with nuclear localization of period protein.

B-18 **J. P. Harney, K. Scarborough, K. Rosewell, P. M. Wise** (Department of Physiology, University of Kentucky College of Medicine, Lexington, KY; Department of Neurobiology and Physiology, Northwestern University, Evanston, IL): Effect of intracranial infusion of VIP antisense oligonucleotides into the suprachiasmatic nuclei (SCN) on the LH surge in the rat.

B-19 Michaela Hau (Max Planck Institut für Verhaltensphysiologie, Andechs, Germany):  
Entrainment of house sparrow circadian rhythms to feeding cycles with different food access times.

B-20 Sabine Heigl (Max Planck Institut f. Verhaltensphysiologie, Abt. Gwinner, Andechs, Germany)  
Periodic food availability entrains circadian rhythms in pinealectomized house sparrows.

B-21 Martha Hotz Vitaterna, Phil L. Lowrey, David McDonald, William F. Dove, Lawrence H. Pinto, Fred W. Turek, Joseph S. Takahashi (NSF Center for Biological Timing, Department of Neurobiology and Physiology, Northwestern University, Evanston, IL; McArdle Laboratory for Cancer Research, University of Wisconsin Medical School, Madison, WI):  
Identification of a circadian clock mutant in the mouse.

B-22 Norio Ishida, Miwa Matsui, Youji Mitsui (National Institute of Bioscience and Human Technology, AIST, MITI, Tsukuba Science City 305, Japan):  
Circadian and light regulation of pp2.5 mRNA in the Suprachiasmatic Nucleus of rat brain.

B-23 Janet E. Joy (NIMH Neuroscience Center at Saint Elizabeths, Washington, D.C.):  
Proteins associated with the maturation of the circadian clock in the reproductive tract of the male Gypsy moth.

B-24 S.B.S.Kalsa, D.Whitmore, B.Bogart, G.D.Block (Department of Biology, University of Virginia, Charlottesville, VA):  
Evidence for direct involvement of transcription in the timing mechanism of a circadian pacemaker.

B-25 Hak Yong Kim, Gary G. Coté, Richard C. Crain (Dept. of Molecular and Cell Biology, Univ. of Connecticut, Storrs, CT):  
Circadian rhythmic regulation of light-responsive potassium channels in protoplasts from *Samanea saman pulvini*.

A-27 MOUSE MUTANT WITH ALTERED CIRCADIAN RHYTHM: PRELIMINARY BEHAVIORAL AND GENETIC ANALYSIS

Gary E. Pickard<sup>1,2,5</sup>, Patricia J. Sollars<sup>1,5</sup>, Eugene M. Rinchik<sup>6</sup>, Allan I. Pack<sup>3,5</sup> and Maja Bucan<sup>1,4,5</sup>

Departments of Psychiatry<sup>1</sup>, Neuroscience<sup>2</sup>, Medicine<sup>3</sup> and Genetics<sup>4</sup>, Center for Sleep and Respiratory Neurobiology<sup>5</sup>, University of Pennsylvania School of Medicine, Philadelphia, PA and Division of Biology<sup>6</sup>, Oak Ridge National Laboratory, Oak Ridge, TN.

A-28 THE USE OF DIFFERENTIAL DISPLAY IN THE ANALYSIS OF GENE EXPRESSION IN SCN

Patrick Nolan<sup>1</sup>, Patricia J. Sollars<sup>1,4</sup>, Kathy Siwicki<sup>5</sup>, Gary E. Pickard<sup>1,2,4</sup> and Maja Bucan<sup>1,3,4</sup>

Departments of Psychiatry<sup>1</sup>, Neuroscience<sup>2</sup>, and Genetics<sup>3</sup>, Center for Sleep and Respiratory Neurobiology<sup>4</sup>, University of Pennsylvania School of Medicine, Philadelphia, PA and Department of Biology<sup>5</sup>, Swarthmore College, Swarthmore, PA.

B-26 Michael Roberts - "Nitric Oxide Synthase in the eye of Bulla:

B-27 Piatr Złomanczuk "Melatonin sensitivity in SCN neurons in Djungarian hamsters exposed to constant light"